

REMARKS

This application has been reviewed in light of the Office Action dated December 31, 2002. Claims 1-25 are pending in this application. Claims 1-5 and 8-25 have been amended to define still more clearly what Applicant regards as his invention. Claims 1, 4, 8, 10, 13, 16, 20, 22, and 25 are in independent form. Favorable reconsideration is requested.

The Office Action rejected Claims 1-25 under 35 U.S.C. § 102 (b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103 (a) as being obvious over, U.S. Patent No. 5,116,149 (Yamasaki). Applicant respectfully traverses these rejections.

Applicant submits that independent Claims 1, 4, 8, 10, 13, 16, 20, 22, and 25, together with the remaining claims dependent thereon, are patentably distinct from Yamasaki at least for the following reasons.

The aspect of the present invention set forth in Claim 1 is a printing apparatus that scans a print head over a printing medium a plurality of times, performs printing on the print medium during each scan, and feeds the print medium a predetermined amount in a direction that is different from a scanning direction of the carriage. The print apparatus gets information relating to a printing medium feeding period, which is required for feeding the print medium the predetermined amount after completing the printing of the preceding line in a preceding scan. The print apparatus also sets a carriage scanning period, which is required to start the printing of the next line after completing the printing of the preceding line so as to become substantially equal to the printing medium feeding period, depending upon a printing completion position of the preceding line and the printing start position of the next line. In addition, the print apparatus drives the carriage depending upon a period set by the carriage scanning period setting means.

One important feature of Claim 1 is setting the carriage scanning period so as to become substantially equal to the printing medium feeding period.

An example of adjusting the carriage scanning period to become substantially equal with the printing medium feeding period is provided in the substitute specification at pages 10 and 11, paragraph 0060. The example provides two scenarios. First, when the carriage scanning period is greater than the printing medium feeding period, there is no waiting period between scanning the first and second line. On the other hand, when the carriage scanning period is less than the printing medium feeding period, a waiting period is provided between scanning the first and second line. Thus, in either scenario, after the printing medium feeding period is completed, the printing for the second line begins. Consequently, the time for printing an image is minimized because the carriage scanning period is substantially equalized with the printing medium feeding period. (It is to be understood, of course, that the scope of Claim 1 is not limited to the details of this embodiment, which is referred to only for purposes of illustration.)

Yamasaki, as understood by Applicant, relates to a printer for reducing printing operation time. In Yamasaki, a carriage scanning starts when a relation between "T1" and "T2" becomes $T1 < T2$. Even if one takes T1 as corresponding to the carriage scanning period of Claim 1 and T2 as corresponding to a printing medium feeding period of Claim 1, the Yamasaki carriage scanning is completed after completion of the printing medium feeding, i.e., the carriage scanning period and the printing medium feeding period never become equal.

In addition, since the printing apparatus of Claim 1 has features that allow the carriage scanning to be completed at the same time that the printing medium feeding is completed, then the time before printing of the next line begins is relatively short. On the other hand, in Yamasaki, the carriage scanning period is completed *after* the printing

medium feeding. Consequently, the time before printing the next line begins is longer as compared to the apparatus as recited in Claim 1.

Applicant submits that at least for these reasons, Claim 1 is patentable over Yamasaki.

Independent Claims 8, 10, 13, 20, 22, and 25 each recite the same feature of setting the carriage scanning period so as to become substantially equal to the printing medium feeding period, as discussed above in connection with Claim 1. Accordingly, Claims 8, 10, 13, 20, 22, and 25 are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

The aspect of the invention set forth in Claim 4 is a printing apparatus scanning a printing head over a printing medium a plurality of times, to perform printing upon the print medium during each respective scan and to feed the printing medium a predetermined amount in a direction different from a scanning direction of a carriage, where the printhead is mounted on the carriage.

The printing apparatus includes means for getting information relating to a printing medium feeding period required for feeding the printing medium for the predetermined amount after completion of printing in a preceding line in a preceding scan. The apparatus also includes means for getting information relating to a carriage scanning period from an end position of printing of the preceding line to a start position of printing of the next line in a scanning direction of the carriage. Driving means of the apparatus drive the carriage to scan to start printing of the next line, after completion of printing in the preceding line, depending upon a relationship between the carriage scanning period and the printing medium feeding period. The carriage driving means starts printing the next line without stopping the carriage subsequent to the printing of the preceding line when the carriage scanning period is more than the printing medium feeding period and the printing

directions of the preceding line and the next line are the same direction.

Important features of Claim 4 are that the printing of a line starts *without stopping* the carriage subsequent to the printing of the preceding line when the carriage scanning period is more than the printing medium feeding period and the directions of the preceding line and the next line are the same.

In Yamasaki, the carriage stops between completing the printing of the preceding line and starting the printing of the next line (see, e.g., the specification at column 5, lines 61 to 68, and step 58 of Figure 7), even if the carriage scanning period is more than the printing medium feeding period.

Applicant submits that at least for this reason, Claim 4 is patentable over Yamasaki.

Independent Claim 16 is a carriage scan driving method that corresponds to apparatus Claim 4, and is believed to be patentable for at least the same reason as discussed above in connection with Claim 4.

The other rejected claims in this application depend from one or another of the independent claims discussed above, and, therefore, are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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